Matthew D'Arcy

Drexel University
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Arctic Regional Communications Small Satellite (ARCSat)

The Arctic is increasingly important to US economic and national security as manifested by the issuance of a National Security Policy Directive on the Arctic by the White House (NSDD-25). However, the level of activity projected for the region exceeds the infrastructure capacity of the region. To address this issue, a HSV Team consisting of VCSI, MSFC, EUCOM and Dynetics has framed low cost, regional communications systems to address emerging user operational requirements and to validate some emerging technologies. Referred to as ARCSat, this project would capitalize on the already deployed FASTSat microsat, the on-going Arctic Collaborative Environment Project and the NOAA HIRAD Project and provide a critical capability to the Arctic Region of the globe. The current mission concept involves one MicroSatellite or Mothership and four communications CubeSats which would fly in formation as a phased array antennae.. The Mothership would be launched from Kodiak, Alaska on either an Athena or Minotaur rocket. The Mothership would serve as the com and data management center and it would deploy the four CubeSats with advanced software defined radios with capabilities far in excess of the current Iridium system. By providing this over the horizon communications capability, end users can pick up information being transmitted from the ground and relay it to the Mothership which then relays the signals back to a ground station.

Research and Experience

- **Marshall Space Flight Center**, NASA Academy Intern, Summer 2012
  VCSI: Frame reference mission; assess alternative instruments and sensors; assess optimal international contributions; assistance to proposal formulation
- **NASA – Reduced Gravity Student Flight Opportunities Program**, Houston, TX, Summer 2011
  Proposal formulation; test bed design and fabrication; structural analysis; microgravity experimentation; educational outreach presentations
- **E. I. DuPont de Nemours & Co,** Engineering Technician, Chambers Works, NJ, Apr-Sept 2011
  Process Safety Critical equipment inventory; operating permit modifications; safety training

Memberships and Activities

Founder and President of Drexel Amateur Radio Club – W3MGF, Member of Drexel chapter of ASME, Space Systems Laboratory, and Sigma Phi Epsilon

Honors, Awards

Drexel University Dean's Scholarship Recipient, The State of New Jersey's Edward J. Bloustein Distinguished Scholar, Sigma Phi Epsilon's PA Beta Beta Balanced Man Scholarship Recipient